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Critical Situation of Bone Marrow Transplantation: Information Distribution Regarding the Problem of a Shortage of Bone Marrow Filters

Many drugs and devices are essential to conduct hematopoietic stem cell transplantation (HSCT). The hematopoietic transplant community has been influenced by numerous drug and device shortages over the past several years in both Japan and other countries. This problem has included critical drugs for hematopoietic transplantations such as gancyclovir, dexamethasone, lenograstim, imipenam, and cephepime. Recently, the discontinuation in the supply of the anticancer drug thio-tepa was announced by a pharmaceutical company in Japan; however, this process and decision were not sufficiently disclosed by the Ministry of Health, Labor, and Welfare (MHLW). As a result, the hematopoietic transplant communities are thus considered to urgently require the establishment of effective management in the event of such future crises. Although information disclosure is a key to crisis management, how to disclose bad news to patients remains a difficult issue [1-3] because proactive information disclosure may unnecessarily stir up the anxiety of the patients. The number of studies focusing on this topic in the medical field is limited [4].

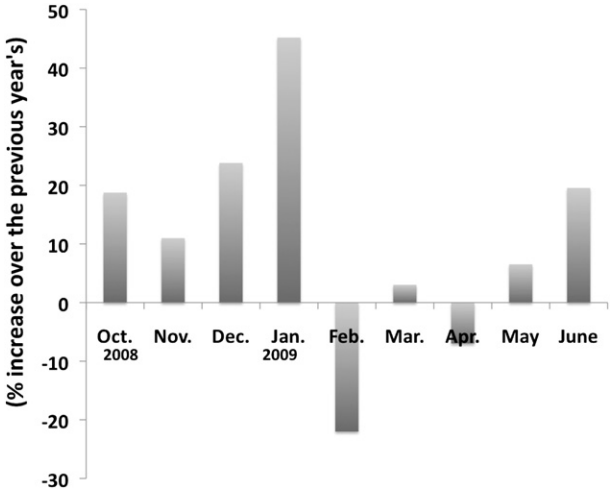

Figure 1. Bone marrow transplantation from unrelated donors on a year-to-year basis The number of bone marrow transplantations from unrelated donors per month from November 2008 and May 2009 is represented on a year-to-year basis (percent increase in 2009 by same month in 2008). There were 78 cases in February 2009, which was 78% compared with the same month in the previous year. The number of bone marrow transplantations from unrelated donors was obtained from the JMDP Website.

In December 2008, a termination of the supply of the Bone Marrow Collection Kit (BMCK) made by Baxter Limited (Tokyo, Japan) was identified in Japan. This kit is used for filtering bone marrow(BM) aspirate during BM transplantations (BMT) [5], and it is essential for the prevention of thrombosis associated with the infusion of BM aspirate. As an alternative, the Bone Marrow Correction System made by the venture company BioAccess Inc. (Baltimore, MD) is available, but this product had not been approved in Japan, although it has been approved by the U.S. Food and Drug Administration (FDA). In Japan, peripheral blood stem cell transplantations (PBSCs) from unrelated donors are not approved, thus resulting in a reliance on BM only, so there was a possibility that the disruption in the supply of the BM filters would result in a complete suspension of HSCT from unrelated donors. Considering the stock quantity within Japan (approximately 500 units) held by Baxter at the end of December, it was predicted that BMT would not be available until mid-March 2009.

This problem was eventually resolved by the prompt approval of the kit from BioAccess by MHLW on February 26, 2009. However, during this period, the problem of the disruption in the supply of the BM filters was widely reported throughout the media in Japan, thereby generating great public interest.

This case shows the unfavorable impact on medical practice if the government does not proactively disclose information to society. The responses of MHLW were slow, and no information was disclosed

for approximately 1 month after the problem was initially revealed; it was only on January 23 that the MHLW indicated that it would promptly approve the BioAccess product and pay for it with public health insurance. This is in contrast to other organizations, such as the Japan Society for Hematopoietic Cell Transplantation (JSHCT), the Japan Marrow Donor Program (JMDP), and the Japan Marrow Donor Registry Promotion Conference, that responded quickly after the problem was revealed. Compared to 2008, the number of BMT from unrelated donors in February 2009 decreased dramatically before increasing again in March (Figure 1). Because each donor collects and keeps autologous blood, the schedule for bone marrow harvesting must be determined at least 1 month in advance, and usually 2 months in advance, before the date of BM harvest. Most BM transplantations in January 2009 had already been scheduled at the end of the December 2008, and those could all be successfully performed due to a sufficient stock of BMCK. On the other hand, the decrease in the number of BMT that occurred in 2009 February strongly indicates a clear association with the shortage of BMT filters reported at the end of December. The delayed information disclosure might havd caused anxiety among patients and healthcare professionals, resulting in a decreased number of BMT , and it is highly likely that some patients were unable to receive BMT at the appropriate time.

This case is thought-provoking, considering the role that academics can play in a "critical situation" such as that of a sudden termination of the supply of a medical product. The JSHCT provided information to healthcare professionals immediately after the shortage problem was revealed. In addition, they approached MHLW to solve the problem at an early point and made the process public. It was probably effective for the sharing of information among healthcare professionals. The JSHCT introduced a signature campaign of a patient organization on their Website and supported the signature campaign. It would be highly appreciated if increased cooperation between the community and patients could solve this product shortage problem. It also probably played an active role in public policy making. We should therefore recognize that the establishment of mutual trust between the transplantation community and society as a whole is therefore considered to be essential for the further development of transplantation.

This product shortage problem was caused by the economic crisis to medical practice. Similar cases will be possibly repeated in the future. This incident made a significant political impact. It was repeatedly reported in the mass media, thereby arousing great interest of many citizens. The Japanese Diet is now planning to establish an alternative backup system for critical drugs or medical devices in the near future.

In conclusion, the best method for eliminating anxiety among health care professionals and patients is a thorough disclosure of information, and strong appeal for the need to establish an appropriate method for information disclosure. The results of this study may not be generalized outside of Japan because of the unique situation in Japan; however, the globalization of the manufacturing processes could account for sudden catastrophic shortages, as well as the loss of manufacturing credentialing in 1 country that could thus suddenly affect the worldwide supply of critical drugs and medical goods. We therefore believe that this study would be beneficial for the optimization of information distribution in critical situations in many countries.

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